

# **Overview of Risk Management at Seattle City Light For The City Light Advisory Board**

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## ***Background***

City Light has been trading power on the wholesale market for decades to meet temporary deficits and to dispose of surplus energy. This task was originally performed by power dispatchers whose primary responsibility is maintaining the system's energy balance in real-time. They therefore could devote little effort to marketing and most buying and selling took place on an hour-ahead or day-ahead basis only as needed. Deregulation of wholesale power markets in the mid-1990's made that approach untenable.

In 1996 the utility began the planning necessary to establish a dedicated trading function, and in 1998 received the budget authority to set up the Power Marketing Group (PMG) the following year. The group began operating in July 1999.

## ***Current Structure***

There are four main components to City Light's current risk management structure: The Risk Management Committee (RMC), the Credit Committee, the Risk Officer, and Power Management (see organizational chart on page 5).

The RMC is made up of the Superintendent, Deputy Superintendents for Power Management, Finance and Administration, and Generation, the Director of Strategic Planning/Environment and Safety, and the Risk Officer. It is staffed by senior staff from a variety of related areas. The RMC sets risk management and marketing policy, and makes certain marketing decisions. It meets weekly to review the latest physical and financial position in the wholesale market and key indicators of the state of the system (examples on pages 6 and 7).

The Credit Committee is an adjunct to the RMC. It is made up of the Director of Finance, the Deputy Superintendent of Power Management, the Director of Account Services, and the Risk Officer. The Credit Committee recommends credit policy to the RMC and monitors and manages the credit risks associated with the trading function.

The Risk Officer is responsible for maintaining the Risk Management Manual and ensuring that the policies and procedures set forth in it are followed. The Risk Officer is also responsible for staffing the RMC and providing risk management advice to it and the Superintendent.

Power management houses City Light's wholesale market trading function. It has separated the function into Front, Middle, and Back Offices to facilitate oversight and control. The Front Office is responsible for actual trading. The Middle Office performs market research, risk measurement and management, and is also responsible for determining how the resource portfolio will be operated on a monthly basis. The Back Office approves payments and billing, and monitors compliance with credit limits.

## ***Risk Management***

Although City Light had been trading in the wholesale market for decades, it was not until the creation of the PMG that it instituted formal risk management policies. These were set forth in the first Risk Management Manual in October 1999. There have been two revisions of the manual since then: The first in 2001 following the Deloitte & Touche review, and the second in 2003 following the Vantage review. The current version, V3.0 (included), was transmitted to Council for review in February, but Council chose not to act on it until completion of the risk management workshop series.

City Light trades in the spot and forward markets<sup>1</sup>, primarily in the Mid-Columbia and California-Oregon border trading hubs. As used here, the spot market refers to any trading period within the current month (hour-ahead, day-ahead, balance of month), and the forward market refers to contracting periods of 1 to 18 months into the future, which is the limit of its trading authority.

Over 80% of City Light's power portfolio is hydro-based. Given its current portfolio and retail load, it can expect to have about 4 million megawatt-hours to sell on average into the wholesale market. In a wet year this could be as high as 7 million, and in a dry year as low as 1.3 million<sup>2</sup>. Looked at another way, City Light's generation can swing by about 60% of its retail load from year to year. Not only is its portfolio extremely volatile, it is also largely unpredictable. Together, these present significant risk management challenges.

City Light's resource planning begins in October. This reflects the seasonal pattern of precipitation in the Northwest: between October and December the Northwest receives almost half of the total precipitation it will receive in the 12-month period from October to September.

## ***Current Strategy***

When it was first set up, the PMG's risk management strategy was to sell 50% of projected surpluses up to two months into the future, and to buy between 50% and 80% of projected deficits over the same time horizon. These trades were executed on a megawatt-hour averaging basis where an eighth of the target amount would be traded each week over the two month horizon. This strategy was captured in the Weekly Marketing Plan (WMP) administered by the Middle Office and executed by the Front Office.

Following the experience of the energy crisis, and facing a significant surplus even under drought conditions, City Light changed its strategy in the fall of 2002. Since City Light's trading authority spans portions of at least two water years at any given time, it has two different strategies—one for future water years and one for within the current water year. These strategies are intended to secure some price certainty in the face of volumetric uncertainty.

For water years beyond the current year and within the 18-month window, City Light sells the surplus available at 95% exceedance water<sup>3</sup>. It does not cover deficits projected at this point because, by construction, there is a 95% probability that they will not materialize.

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<sup>1</sup> City Light currently does not have the authority to trade derivatives.

<sup>2</sup> In a dry year, City Light is in approximate load-resource balance in the winter and surplus the rest of the year.

<sup>3</sup> Flow conditions that will be exceeded 95% of the time.

Once City Light enters a new water year it begins to monitor actual precipitation and medium and long-range climate forecasts from the National Weather Service and other agencies to develop a forecast of water conditions for that year. As the RMC gains confidence in the forecast (often not until December or January), it begins to cover the open position (deficit or surplus) for the balance of the water year. This is done in two phases. In the first phase, the RMC begins the process of selling at least 50% of the surplus expected to exist for each month for the balance of the water year. The RMC may opt to cover some of the deficits at this point, but in general it will leave those for the second phase.

In the second phase, any remaining surplus or deficit is handled through WMP. The WMP covers the current month and the following two months. In general, it allocates half of the surplus or deficit under its purview to the forward market and half to the spot market; however, Power Management reserves the right to deviate from this allocation to address short-term operational needs. The forward market trades that are authorized under the WMP are executed on a megawatt-hour averaging basis, where a portion of the total is transacted each week over the two-month period.

Spot market trading is ultimately responsible for ensuring resources are balanced to load; that is, meeting any residual shortfall from the market and selling any remaining surplus into the market.

The intent of this quantity-based strategy is to secure some level of certainty in wholesale revenues while avoiding the risk associated with over-selling. Put another way, City Light does not take market positions with a view to exploiting price changes; rather its approach in the forward markets is to hedge the physical exposure resulting from the hydro system.

Spot marketing is the only area in which City Light takes market positions with a view to generating revenue from price changes. Using the system's storage, marketers purchase energy in the off-peak period and resell it in the peak; within the peak period they buy on peak to sell during the super peak. Although this is speculative, the risks are very small – prices during the purchase periods have almost never been above prices during the resale periods. Furthermore, the size of these speculative positions is limited by the amount of physical storage available over the relevant period.

### ***Going Forward***

The Deloitte & Touche (D&T) report (August 2000) on the PMG focused on areas: assessment of the performance of the group relative to expectations, and a gap analysis of the major functions associated with trading and risk management.

The gap analysis highlighted the need for greater segregation of duties and greater data security. Most of these recommendations have been implemented. One recommendation not yet addressed is that City Light purchase or develop an integrated risk management software system that combines deal capture, scheduling, trading, and risk management and reporting. At the time the PMG was established, there were few such comprehensive system available; however, the market for such systems has evolved and City Light is actively seeking a suitable system.

The report recommended that City Council become familiar with the trading and risk environment in which City Light operates as a wholesale participant. The utility has provided training for Council members, the Executive, and the Advisory Board in the basics of its

operations and the risks and challenges it faces in the market place. However, City Light understands that this is an ongoing responsibility and views this training as a first step.

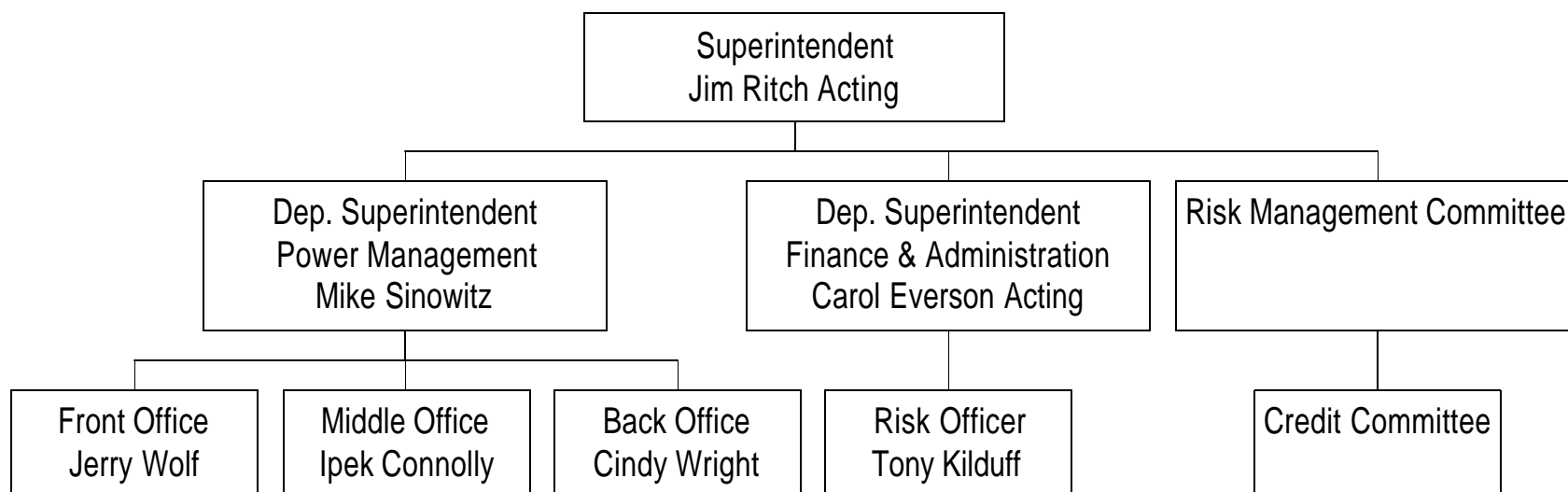
D&T noted that limits and transaction are discussed each week at a strategy session, but recommended that a list of products with associated limits (volume, stop loss, and dollar risk limits) should be formally established by the RMC. The products list was included in the revision to the Risk Management Manual in 2001. The manual provides for the Director of Marketing to establish volume limits each week reflecting existing system conditions.

R.W. Beck, the consultant City Light engaged to provide training for Council, made a series of recommendations at the final workshop to enhance the utility's risk management program.

As a first step, Beck's team recommended that City Light move to a financial measure of risk—they suggested cash flow at risk—as the key driver behind position management. This is in contrast with the quantity based strategy outlined above. Noting that it would be exceedingly difficult to manage to such a measure without access to options and other derivatives as tools, the team recommended that City Light include these in its toolkit, and begin to deploy them on a limited basis until it and the Council became comfortable with their use. Finally, it recommended that the Risk Management Manual be updated to reflect these changes.

City Light has begun the analysis necessary to support a recommendation to Council on a financial measure before the end of the year. At that time it will bring forward a proposal on the limited use of Puts and Calls to reduce the variability in revenue, along with supporting legislation to provide authority to City Light to use financial derivatives.

## Power Marketing and Risk Management



## CURRENT POSITION

Date of Marketing Plan:

August 7, 2003

Forward Prices			Position from Operating Plan (a)				Forward Position				Pre-Sold Daily (b)				Net Open				Less K	
	HLH	LLH	HLH	LLH	aMW	Net Value	HLH	LLH	aMW	Value	HLH	LLH	aMW	Value	HLH	LLH	aMW	Value	HLH	
Jan-03	\$40	\$32	397	(112)	173	\$5,969,265	452	0	253	\$7,709,420	0	0	0	\$0	(55)	(112)	(80)	(\$1,740,155)		
Feb-03	\$74	\$70	421	(20)	232	\$7,276,893	350	0	200	\$5,476,800	0	0	0	\$0	71	(20)	32	\$1,800,093		
Mar-03	\$24	\$21	551	135	368	\$9,568,518	350	0	196	\$6,432,400	0	0	0	\$0	201	135	172	\$3,136,118		
Apr-03	\$32	\$30	757	358	589	\$14,359,740	500	25	299	\$7,434,225	0	0	0	\$0	257	333	289	\$6,925,515		
May-03	\$32	\$22	872	340	637	\$13,723,519	870	275	607	\$12,108,340	0	0	0	\$0	2	65	30	\$1,615,179		
Jun-03	\$41	\$33	914	643	793	\$14,808,607	850	326	617	\$11,769,440	0	0	0	\$0	64	317	176	\$3,039,167		
Jul-03	\$49	\$39	417	150	299	\$10,623,917	350	0	196	\$6,585,800	0	0	0	\$0	67	150	103	\$4,038,117		
Aug-03	\$44	\$38	336	154	256	\$8,348,273	404	0	226	\$7,663,864	0	0	0	\$0	(68)	154	30	\$684,409	(68)	
Sep-03	\$43	\$36	335	71	218	\$6,991,350	264	0	146	\$4,948,996	41	41	41	\$1,270,430	30	30	30	\$771,924	(70)	
Oct-03	\$42	\$34	368	(5)	212	\$7,243,949	200	0	116	\$4,276,800	17	17	17	\$525,028	151	(22)	78	\$2,442,121	51	
Nov-03	\$44	\$36	496	(36)	247	\$8,435,910	225	(25)	108	\$4,036,080	12	12	12	\$373,074	259	(23)	127	\$4,026,756	159	
Dec-03	\$47	\$41	668	(119)	321	\$12,292,503	300	0	168	\$6,645,600	14	14	14	\$494,959	354	(133)	140	\$5,151,943	254	
Jan-04	\$48	\$42	647	(62)	334	\$12,163,665	25	0	14	\$499,200	12	12	12	\$435,728	610	(74)	308	\$11,228,737	510	
Feb-04	\$46	\$37	757	152	486	\$15,124,783	25	0	14	\$460,800	13	13	13	\$407,406	719	139	459	\$14,256,577	619	
Mar-04	\$39	\$30	775	170	521	\$14,983,309	127	0	74	\$2,457,121	21	21	21	\$598,290	627	149	426	\$11,927,898	527	
Apr-04	\$33	\$27	906	226	619	\$14,323,475	264	125	205	\$4,736,059	58	58	58	\$1,403,937	584	43	356	\$8,183,478	584	
May-04	\$27	\$20	1,245	919	1,094	\$20,896,723	361	125	252	\$5,831,820	84	84	84	\$1,692,489	799	710	758	\$13,372,413	699	
Jun-04	\$29	\$22	1,234	1,193	1,217	\$23,319,466	354	125	257	\$5,789,835	88	88	88	\$1,832,854	792	980	871	\$15,696,777	692	
Jul-04	\$39	\$30	1,131	302	765	\$22,453,610	185	0	103	\$3,689,496	87	87	87	\$2,485,128	859	215	575	\$16,278,987	759	
Aug-04	\$49	\$37	762	266	544	\$18,592,875	175	0	98	\$3,364,400	75	75	75	\$2,628,482	512	191	371	\$12,599,993	412	
Sep-04	\$46	\$36	411	65	257	\$8,364,725	175	0	97	\$3,235,000	54	54	54	\$1,754,686	182	11	106	\$3,375,039	82	
Oct-04	\$46	\$37	498	70	310	\$10,382,970	0	0	0	\$0	19	19	19	\$640,436	479	51	291	\$9,742,534	379	
Nov-04	\$44	\$36	498	(39)	260	\$8,291,394	0	0	0	\$0	12	12	12	\$376,233	486	(51)	248	\$7,915,161	386	
Dec-04	\$49	\$42	681	(130)	323	\$12,059,596	0	0	0	\$0	12	12	12	\$438,657	669	(142)	311	\$11,620,939	569	
Jan-03 Jan-04		To To	Dec-03 Dec-04	\$119,642,445 \$180,956,590		\$85,087,765 \$30,063,731				\$2,663,491 \$14,694,326				Aug-03 Dec-03		\$13,077,154 \$136,198,533				

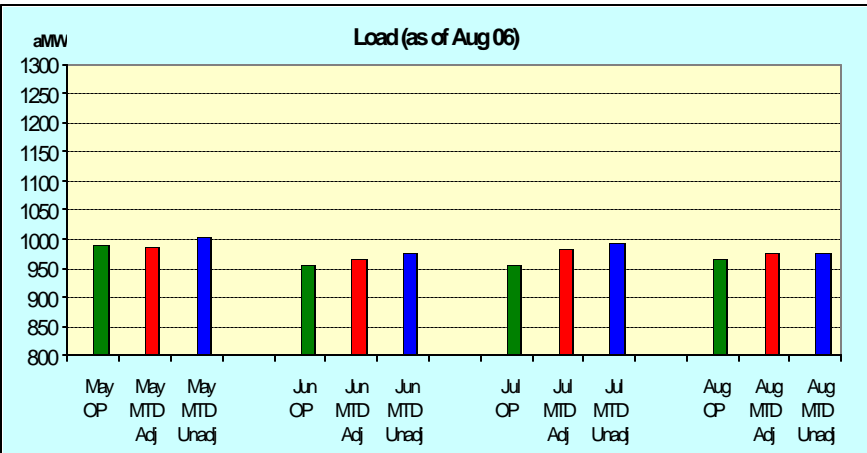
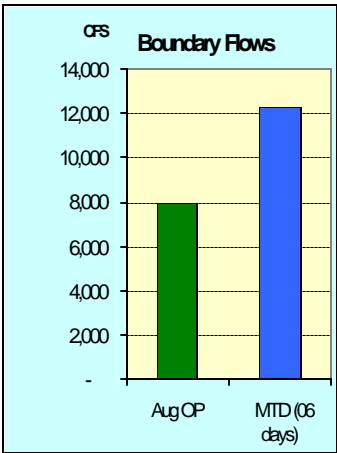
VaR	\$24,251,406
Price	\$14,329,337
Volume	\$12,402,587
Deltas	
Price	\$3,685,851
Volume	324,818

2003 Revenue Secured	\$103,901,800
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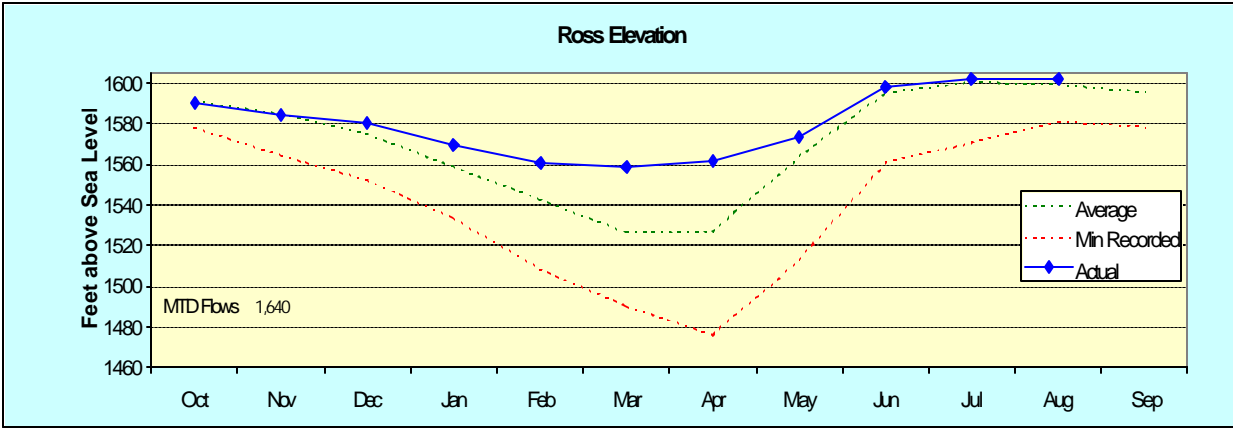
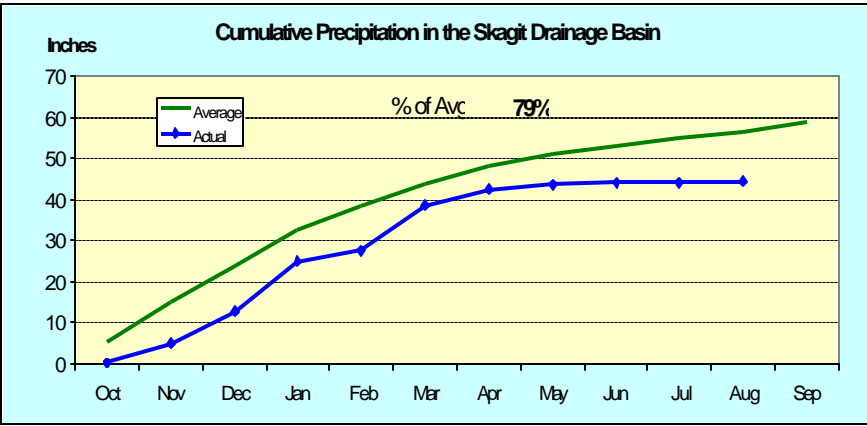
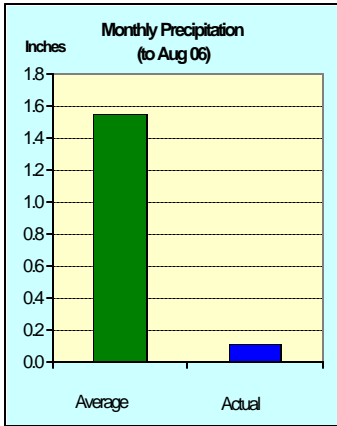
Gas	
Swap Position	\$0
Spot position (12-month)	(\$25,111,559)
AECO: 12-Month Avg	\$4.15 /MMBtu

(a) Klamath assumed running in all forecast months

(b) Estimated volume. Value based on Mid-C forward plus adders



SKAGIT BASIN



COLUMBIA BASIN FORECASTS

	% of Avg	Updated
Basin Precipitation (Including Canada)	89%	10/May

MARKET VALUE OF 2003 POSITION

